<table>
<thead>
<tr>
<th>Outline</th>
<th></th>
<th>Speaker/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction</td>
<td>Welcome/logistics/introductions</td>
<td>Jackie Kanyuk, BCNPHA</td>
</tr>
</tbody>
</table>
| 2. Context & CoV response | • Climate projections  
|                    | • Risks  
|                    | • Preparations at the City of Vancouver                         | Tamsin Mills, City of Vancouver                           |
| 3. Metro Van Case study | • Extreme heat response, Metro Van Housing  
|                    | • Existing tools & resources                                    | Ulryke Weissgerber, Metro Vancouver                       |
| 4. Low/no- cost strategies | • Low cost/no cost strategies for single family and low-rise buildings | Chris Higgins, City of Vancouver                         |
| 5. COVID-19 Guidance | • COVID-19 transmission  
|                    | • Cleaning and disinfection  
|                    | • Considerations for setting up cooling rooms                   | Angela Eykelbosh, National Collaborating Centre for Environmental Health, BCCDC |
| 6. Resources       | • BC Housing tools and resources                               | Jackie Kanyuk                                             |
| 7. Closing Remarks | • Q+A and closing remarks                                      | Jackie Kanyuk                                             |
A Changing Climate

Hotter, Drier Summers

with air quality issues
A number of temperature records were broken on Tuesday August 29, 2018:

- Vancouver Harbour 30.5 C (28.9 C in 1967)
- Kamloops 38.5 C (35.6 C in 1915)
- Princeton 36 C (35 C in 1897)
- Sparwood 32.1 C (30.6 C in 1972)
- Williams Lake 31.9 C (31.1 C in 1967)
- Pemberton 35.1 C (34.4 C in 1974)
- Whistler 31.8 C (31.1 C in 1996)
Warmer, wetter winters

Hotter, drier summers
Figure 7: Cooling Degree Days – Past and Future (2050)
Air quality advisories 1996-2018

Data in this graph was provided by Metro Vancouver.
“authorities expect [a] 120 percent increase in daily physician visits and an 80 percent rise [in] asthma prescription medications dispensed at pharmacies, according to the BC Centre for Disease Control.”

- The National Post (August 21, 2018)
When it rains it pours

Longer Growing Season
BC Climate Projections 2050

• Van. Isl.: Similar to Vancouver projections

• Interior and Cariboo: also hotter and drier with a longer dry season and increased risk of wildfire.

• North: Increased precipitation in summer but with warmer temperatures

• Streamflow changing: less summer precip., reduced snowpack, earlier / more rapid snowmelt
## BC Climate Risk Assessment

### Summary of Risk Assessment Rankings

<table>
<thead>
<tr>
<th>RISK EVENT</th>
<th>PRESENT-DAY LIKELIHOOD</th>
<th>2050 LIKELIHOOD</th>
<th>CONSEQUENCE</th>
<th>RISK SCORE AND RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe wildfire season</td>
<td>3</td>
<td>4</td>
<td>4.5</td>
<td>18.0 High</td>
</tr>
<tr>
<td>Seasonal water shortage</td>
<td>4</td>
<td>5</td>
<td>3.4</td>
<td>16.9 High</td>
</tr>
<tr>
<td>Heat wave</td>
<td>3</td>
<td>4</td>
<td>3.6</td>
<td>14.5 High</td>
</tr>
<tr>
<td>Ocean acidification</td>
<td>2</td>
<td>5</td>
<td>2.8</td>
<td>13.8 High</td>
</tr>
<tr>
<td>Glacier mass loss</td>
<td>1</td>
<td>5</td>
<td>2.5</td>
<td>12.5 High</td>
</tr>
<tr>
<td>Long-term water shortage</td>
<td>3</td>
<td>3</td>
<td>4.0</td>
<td>12.0 High</td>
</tr>
</tbody>
</table>
Heat Event Preparedness and Response

Extreme Heat IRG

• Event Escalation & Notification
• Preparedness Activities
• Response Activities
  – Increase access to drinking water
  – Provide shelter from heat
  – Monitor outdoor spaces & SROs
  – Messaging
• Tools
  – Notification templates & agendas, contact list, key messaging by topics, web links, handouts, etc.
Long Term Planning for Heat

- Pilot clean air shelters
- Building bylaw changes
- Adding water fountains
- Temporary spray parks
- Improving shade where needed
- Non-market housing - temporary and long term fixes
Thank you

Tamsin.mills@vancouver.ca
Sustainability Group
City of Vancouver
Metro Vancouver Housing Sites

3,400 TOTAL UNITS

35% BELOW MARKET

65% LOW INCOME

9,400 TOTAL TENANTS
https://www.ccohs.ca/products/posters/pdfs/keepyourcool.pdf
Neighbourhood Information

Tips to Beat the Heat!

- **Keep Hydrated**: Drink lots of water.
- **Limit**: Non-essential strenuous activity during the hottest parts of the day.
- **Soak**: Take a cool shower or bath to help you cool down.
- **Avoid**: Alcohol and caffeine as they can make dehydration worse.
- **Be Cool**: Stay indoors and make use of fans and air conditioners.
- **Check Conditions**: Including children, elderly, people with medical conditions and pets.
- **Eat Light**: Try eating cold foods such as salads and fruits.
- **Dress Light**: Wear lightweight clothing and use sun screen.
- **Dress Down**: Wear lightweight clothing and use sun screen.

**Watch Out... Be on the lookout for any symptoms of heat-related illness or conditions**

See a doctor if you are not feeling well, and in a medical emergency call 911.

Places to cool off near Kingston Gardens:

- **Guildford Recreation Centre**: 15105 105 Ave, Surrey (604) 502-6360
  - Hours of operation: Mon to Fri: 6am-10pm Sat and Sun: 8am-8pm
Date: June 13, 2019

To: All Residents, Cedarwood Place

From: Lisa Jacques, SW Area Manager
Mary Ricci, Tenant Programs & Services Supervisor

Cc: 

RE: Cooling Zone at Cedarwood Place

Metro Vancouver Housing is pleased to provide a cooling zone in the Cedarwood Place Community Room during the summer months for residents to enjoy.

The air conditioning unit will run from 9:00 am to 10:00 pm daily.

During extreme heat events, residents are reminded to drink lots of water, wear lightweight clothing, limit strenuous activity, stay indoors and enjoy the cooling room.

To ensure the cooling zone works properly:

- Do not tamper with the controls on the air conditioning unit
- Keep doors to the room closed at all times to keep the cool air in.

If temperature adjustments are required, please let us know.

Your comments are always welcome.
Daily Safe Checks

- Program is voluntary, 100% participation not required
- Interested tenants place a hotel style card on the outside of their door
- The card is removed on waking
- Tenant volunteers check each door at a pre-appointed time every day (around noon)
- If a card is still on a door, attempts to reach the tenant are made (by knocking on the door, phoning, and contacting site staff)
- Residents just that if lonely and wanting a visit, leave the card on the door
Thank you
Low-Rise Residential: Lower Cost Actions to Improve Air Quality
CITY-WIDE BUILT RESIDENTIAL FLOOR AREA (2014-18)

- 26% MID-/HIGH-RISE (>4 STOREYS)
- 6% MIXED-USE
- 5% LOW-RISE (≤4 STOREYS)
- 9% DUPLEX, TH, RH, MCD
- 55% SINGLE-FAMILY

LOW-RISE IS NEARLY 70%
What is PM 2.5?

HUMAN HAIR
50-70 µm (microns) in diameter

PM 2.5
Combustion particles, organic compounds, metals, etc.
< 2.5 µm (microns) in diameter

PM 10
Dust, pollen, mold, etc.
< 10 µm (microns) in diameter

90 µm (microns) in diameter
FINE BEACH SAND
What is PM 2.5?

SARS-CoV-2 (COVID-19) 60–140 nm
BACTERIA ~1 μm
PM2.5 <2.5 μm
RED BLOOD CELL ~7 μm
PM10 ≤10 μm

#SEETHEAIR
Where does PM 2.5 come from?

- Transportation
- Construction
- Burning for agriculture
- Household
- Industrial Factory
<table>
<thead>
<tr>
<th>MERV Rating</th>
<th>Air Filter will trap Air Particles size .03 to 1.0 microns</th>
<th>Air Filter will trap Air Particles size 1.0 to 3.0 microns</th>
<th>Air Filter will trap Air Particles size 3 to 10 microns</th>
<th>Filter Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MERV 1</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>Removes These Particles</td>
</tr>
<tr>
<td>MERV 2</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>Fiberglass &amp; Aluminum Mesh</td>
</tr>
<tr>
<td>MERV 3</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>Pollen, Dust Mites, Spray Paint, Carpet Fibres</td>
</tr>
<tr>
<td>MERV 4</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>Cheap Disposable Filters</td>
</tr>
<tr>
<td>MERV 5</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>20% - 34%</td>
<td>Mold Spores, Cooking Dusts, Hair Spray, Furniture Polish</td>
</tr>
<tr>
<td>MERV 6</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>35% - 49%</td>
<td>Better Home Box Filters</td>
</tr>
<tr>
<td>MERV 7</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>50% - 69%</td>
<td>Lead Dust, Flour, Auto Fumes, Welding Fumes</td>
</tr>
<tr>
<td>MERV 8</td>
<td>&lt; 20%</td>
<td>&lt; 20%</td>
<td>70% - 85%</td>
<td>Superior Commercial Filters</td>
</tr>
<tr>
<td>MERV 9</td>
<td>&lt; 20%</td>
<td>Less than 50%</td>
<td>85% or Better</td>
<td>Bacteria, Smoke, Sneezes</td>
</tr>
<tr>
<td>MERV 10</td>
<td>&lt; 20%</td>
<td>50% to 64%</td>
<td>85% or Better</td>
<td>HEPA &amp; ULPA</td>
</tr>
<tr>
<td>MERV 11</td>
<td>&lt; 20%</td>
<td>65% - 79%</td>
<td>90% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 12</td>
<td>&lt; 20%</td>
<td>80% - 90%</td>
<td>90% or Better</td>
<td>Viruses, Carbon Dust, &lt;.30 pm</td>
</tr>
<tr>
<td>MERV 13</td>
<td>Less than 75%</td>
<td>90% or Better</td>
<td>90% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 14</td>
<td>75% - 84%</td>
<td>90% or Better</td>
<td>90% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 15</td>
<td>85% - 94%</td>
<td>95% or Better</td>
<td>90% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 16</td>
<td>95% or Better</td>
<td>95% or Better</td>
<td>90% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 17</td>
<td>99.97%</td>
<td>99% or Better</td>
<td>99% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 18</td>
<td>99.997%</td>
<td>99% or Better</td>
<td>99% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 19</td>
<td>99.9997%</td>
<td>99% or Better</td>
<td>99% or Better</td>
<td>~</td>
</tr>
<tr>
<td>MERV 20</td>
<td>99.99997%</td>
<td>99% or Better</td>
<td>99% or Better</td>
<td>~</td>
</tr>
</tbody>
</table>

Illustration Provided by LakeAir / www.lakeair.com
Three Approaches

**Single Room**
Lowest cost if limited rooms are to be cleaned

**Whole Home Furnace**
A great option when replacing a furnace or fan coil

**Whole home HRV**
A great option on a new building of any size, filters can be outside the suite for easy maintenance
Cleaning a single room
Clean one room: Blue Air 211+
Cleaning a whole home
Zehnder ComfoWell HRV filter
Operating Costs

Higher MERV filters cost more, though a lower MERV filter could be used part year.

MERV 11 Filter
$30 a year for single family

MERV 16 filter
$120 a year for single family
What it means to a homeowner/renter

**Comfort at home**
due to improved filtration

**Ability to shelter in place**
Less dust, with carbon systems a cleaner smell

**Needed focus on filter change**
Filters must be changed every 12 months
Thank You
COVID-19 Transmission and Precautions for Shared Spaces

May 13\textsuperscript{th}, 2020

Angela Eykelbosh, PhD
National Collaborating Centre for Environmental Health
BC Centre for Disease Control
Angela.Eykelbosh@bccdc.ca

Production of this presentation has been made possible through a financial contribution from the Public Health Agency of Canada.
Established by the Public Health Agency of Canada in 2005 to promote evidence-informed public policy.
COVID-19 Topic Page

• Review of 50+ public health websites
• Many env health topics
• Our documents:
  • Disease backgrounder
  • Building re-opening
  • Precautions for MURBs
  • Guide to masking
  • Outdoor safety

Find it at our website: www.ncceh.ca
Today

- What do we know about transmission?
- What does that mean for MURBs?
- Cleaning & disinfection guidance
- Risk mitigation for cooling centers
Modes of SARS-CoV-2 Transmission

• Evidence supports 5 potential modes.

• Direct contact and respiratory droplets are primary modes.

• Role of aerosols and fecal shedding still unclear
Is the virus “airborne?”

• Means different things to different people
  • Transmits easily via an aerosol over longer distances/periods.
  • E.g., Measles: aerosol that remains suspend for ~2 hours.
  • Can catch it from someone even if you’ve never been in the same room as them.
  • Highly contagious: up to 90% of susceptible contacts will get it!
### What’s the difference?

<table>
<thead>
<tr>
<th>Respiratory droplets</th>
<th>Aerosols</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Large” (&gt; 5 um) gobs of mucus and virus</td>
<td>Relatively smaller (&lt; 5 um)</td>
</tr>
<tr>
<td>Expelled or generated when coughing, sneezing, talking, laughing, singing, and speaking.</td>
<td>Float for minutes to hours, can travel further than 2 m.</td>
</tr>
<tr>
<td>Float a few seconds, fall within ~1 m (~2 m for safety).</td>
<td>Float for minutes to hours, can travel further than 2 m.</td>
</tr>
<tr>
<td>Infect by contacting the eyes or mucus membranes (nose or mouth)</td>
<td>Are inhaled deeper into the lung</td>
</tr>
</tbody>
</table>
Multiphase turbulent gas cloud from a sneeze.

“Throughout the trajectory, droplets of all sizes settle out or evaporate at rates that depend not only on their size, but also on the degree of turbulence and speed of the gas cloud, coupled with the properties of the ambient environment...”

Bourouiba et al. JAMA MAR 26, 2020
Is there a reason for concern?

• People DO generate aerosols:
  • Does every droplet carry the virus? What concentration of virus-laden aerosols are produced?

• Viral RNA HAS been found in the air in hospitals
  • How long does it remain infectious? How far does it travel?

• We CAN artificially generate viral aerosols that remain infectious for hours.
  • Does a sick person generate an aerosol like that, and when? How long does it remain infectious? How many viruses do you need to inhale to establish an infection?
Where are people getting sick?

• 75,000+ cases in China and US:
  • Most transmission is **within families**.
  • Household secondary attack rate varies (~0.5-20%), but is low.

• Outbreaks in residential buildings with **interpersonal interaction** and/or **shared facilities**:
  • Seniors homes, work camps, dorms, prisons.

• There are specific instances in which droplet/aerosol transmission has been implicated over a **short range**.
  • E.g., Guangzhou restaurant, Washington choir, South Korean call centre

• **MURBs? No evidence of outbreaks or long-range transmission to date.**
What does this all mean for MURBs???

- Need to keep people **away** from each other:
  - Close amenities, limit elevator/laundry access, discourage gatherings, electronic meetings.

- Need to enhance **cleaning**:
  - Sustainable enhanced cleaning protocol
  - Prevent cross-contamination in shared facilities
  - Close what you cannot clean

- Need to **communicate** with residents, reinforce health messaging

- Need to keep people **comfortable and healthy** in their homes
Cleaning and Disinfection

• Public Health Agency of Canada: manual cleaning with soap and water and/or a disinfectant product.
  • 2-in-1 products (wipes) only work on lightly soiled surfaces
  • If in doubt, there is a product list.
• High touch surfaces cleaned 2x a day
• Vacuuming: HEPA exhaust filter, diffuser
• Steam cleaning fabric items
• Removing what you can’t clean easily
• Spraying and fogging: problematic
• **Do not mix products! Follow the label!**
• **NCCEH has a guide on disinfectants and household cleaning.**
PPE for Staff/Cleaners

- Should ALWAYS use PPE as per label on the disinfectant product

- Disposable or reusable products OK
  - Launder and dry hot
  - Gloves: use only for that purpose

- Do s/he need a mask?
  - Is the cleaner within 2 m of people?
  - Is s/he creating dust?
  - Does s/he wish to wear a non-medical mask to protect others?

- NCCEH has a guidance doc on masking
Current Guidance on Ventilation for MURBs

• In the building:
  • Consult an HVAC professional
  • Ensure systems is maintained and functioning as designed, run it 24/7, increase outdoor air
  • NCCEH Building Shutdown and Reopening page

• In suites:
  • Increase ventilation (open windows).
  • Air cleaners (ASHRAE)
COVID-19, extreme heat, and smoke

• New normal: Public spaces used for cooling/cleaner air shelters may be closed or restricted
• Staying cool at home or in cooling rooms will be more important
• People who are most vulnerable to heat and smoke are ALSO most vulnerable to COVID-19.
• Sharing indoor spaces = some degree unavoidable risk
• Technical challenge: ventilation and recirculating air
COVID-19, extreme heat, and smoke

• So what should we do?
  • Support in-home cooling with equipment and wellness checks.
  • Outdoor cooling areas: transmission risk greatly decreased
  • Last resort: cooling rooms

• Cooling rooms have some degree of unavoidable risk, but save lives!
  • Cleaning and disinfection
  • Spaced out seating?
  • Masks if do not impede breathing?
  • Portable AC units and portable air cleaners?
Key Messages

• **Close proximity is key for transmission.**
  • Enhanced cleaning and HVAC maintenance are necessary to promote resident health and comfort.

• **Cooling rooms are riskier now;** must manage the risks of extreme heat and social isolation against COVID-19 risk in shared spaces.

• Must communicate with residents to ensure cooling rooms are used when necessary.
What to do: A Checklist

You can do the following things to help reduce the amount of heat in your building:

☐ Check if heat is off in hallways

☐ Open windows in hallways and communal spaces (if safe) to create cross breeze at night and during the day if there is wind, otherwise keep these windows closed

You can do the following to make sure that tenants are aware of what to do in extreme heat situations:

☐ Identify community assets with air conditioning that your tenants can use if there is an emergency
  - These assets can include public spaces such as libraries, malls, community centres, etc.
What to do: A Checklist

☑ Have an information session with tenants and mention:
  • Keeping windows closed during the day and open at night
  • Closing window coverings during the day, if their unit has window coverings
  • Reducing use of heat generating appliances like stoves/ovens to reduce heat emitted
  • The list of places to go in the community that are clean air or cool air shelters

☐ Post tenant information communication sheets about Extreme Heat
  • Post the Health Canada sheet or BC Housing’s Tips to Beat the Heat sheet in common areas

☐ If you have pre-identified tenants, check on them to make sure they are prepared for the heat
  • Pre-identification of tenants, especially vulnerable to extreme heat should be done in the spring
  • For more information about steps to prepare your building(s) for summer extreme heat in the spring time, see the Pre-Season Extreme Heat Checklist.
Communicate with Tenants

**STAYING HEALTHY in the HEAT**

**Why is heat a HEALTH CONCERN?**

- Skin rash
- Muscle cramps
- Dizziness or fainting
- Nausea or vomiting
- Heavy sweating

**HEAT EXHAUSTION**

- Headache
- Rapid breathing and heartbeat
- Extreme thirst
- Dark urine and decreased urination

If you experience any of these symptoms during extreme heat, immediately move to a cool place and drink liquids; water is best.

**HEAT STROKE**

- High body temperature
- Confusion and lack of coordination
- Dizziness/Fainting
- No sweating, but very hot, red skin

**Tips to Beat the Heat!**

- **KEEP HYDRATED**
  - Drink lots of water!

- **LIMIT**
  - Non-essential strenuous activity during the hottest parts of the day.

- **AVOID**
  - Alcohol and caffeine, as they can make dehydration worse.

- **SOAK**
  - Take a cool shower or bath to help you cool down.

- **REST**
  - Make sure you get enough sleep and rest if you are feeling tired.

- **EAT FRESH**
  - Try eating cold foods such as salads and fruits.

- **SEEK SHADE**
  - When outside.

- **CHECK ON OTHERS**
  - Including children, elderly, people with medical conditions and pets.

- **DRESS DOWN**
  - Wear lightweight clothing and use sun screen.

**BC HOUSING**
What to do: Extreme Heat Decision Tree

Heat Wave Warning Initiated

1. Go through the Extreme Heat Checklist

2. Keep windows in common areas closed in the day; only open windows at night when it is cooler outside AND it does not compromise hallway pressurization

Does your building have a central air conditioning system?

- Yes
  - Make sure it is on and operational

- No
<table>
<thead>
<tr>
<th>HEAT STROKE</th>
<th>WHAT TO LOOK FOR</th>
<th>WHAT TO DO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High body temperature (103°F or higher)</td>
<td>Call 911 right away - heat stroke is a medical emergency</td>
</tr>
<tr>
<td></td>
<td>Hot, red, or dry skin</td>
<td>Move the person to a cooler place</td>
</tr>
<tr>
<td></td>
<td>Absence of sweat</td>
<td>Help lower the person's temperature with cool cloths or a cool bath</td>
</tr>
<tr>
<td></td>
<td>Fast, strong pulse</td>
<td>Do not give the person anything to drink</td>
</tr>
<tr>
<td></td>
<td>Headache</td>
<td></td>
</tr>
<tr>
<td>HEAT EXHAUSTION</td>
<td>Tiredness or weakness</td>
<td>Move person to a cool place</td>
</tr>
<tr>
<td></td>
<td>Dizziness</td>
<td>Loosen tight clothes</td>
</tr>
<tr>
<td></td>
<td>Headache</td>
<td>Put cool, wet cloths on the person's body</td>
</tr>
<tr>
<td></td>
<td>Fainting (passing out)</td>
<td>Take a cool bath</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sip water</td>
</tr>
<tr>
<td>HEAT CRAMP</td>
<td>Muscle pain or spasms</td>
<td>Get medical help right away if:</td>
</tr>
<tr>
<td></td>
<td>Stop physical activity and move person to a cool place</td>
<td>The person is throwing up</td>
</tr>
<tr>
<td></td>
<td>Drink water or a sports drink</td>
<td>Symptoms get worse</td>
</tr>
<tr>
<td></td>
<td>Wait for cramps to go away before doing any more physical activity</td>
<td>Symptoms last longer than 1 hour</td>
</tr>
<tr>
<td>HEAT RASH</td>
<td>Red clusters of small blisters that look like pimples on the skin (often on the neck, chest, groin, or in elbow crease)</td>
<td>Keep the rash dry</td>
</tr>
<tr>
<td></td>
<td>Intense scratching of inflamed skin/blisters</td>
<td>Don't scratch the rash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use powder (e.g., baby powder) to soothe the rash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply calamine lotion</td>
</tr>
</tbody>
</table>
### Strategies for Cooling Rooms: Mechanical

<table>
<thead>
<tr>
<th>Type of Cooling</th>
<th>Cost (Purchase and Maintenance)</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Fan Pedestal/Tower</td>
<td>$$</td>
<td><img src="https://via.placeholder.com/15" alt="" /></td>
</tr>
<tr>
<td>Portable Air Conditioners</td>
<td>$$$</td>
<td><img src="https://via.placeholder.com/15" alt="" /></td>
</tr>
<tr>
<td>Window Mounted Air Conditioners</td>
<td>$$$</td>
<td><img src="https://via.placeholder.com/15" alt="" /></td>
</tr>
<tr>
<td>Packaged Terminal Air Conditioners (PTACs)</td>
<td>$$$$$</td>
<td><img src="https://via.placeholder.com/15" alt="" /></td>
</tr>
<tr>
<td>Heat Pumps</td>
<td>$$$$$</td>
<td><img src="https://via.placeholder.com/15" alt="" /></td>
</tr>
<tr>
<td>Central Air Conditioning</td>
<td>$$$$$$</td>
<td><img src="https://via.placeholder.com/15" alt="" /></td>
</tr>
</tbody>
</table>

Least efficient to Most efficient.
Mechanical Cooling: Fans

- Inexpensive
- Low running costs and energy usage
- Portable, adjustable airflow direction
- Provides temporary cooling when directed at the body
- Does not lower room temperature
- Single room use only
**Mechanical Cooling: Portable Air Conditioners**

- ✔ Portable
- ✔ Easy and inexpensive to install
- ✗ Less efficient – discharges heat
- ✗ Electric costs = 5x more than fan
- ✗ Smaller spaces only
- ✗ Noisy operation
- ✗ Has placement restrictions
- ✗ Could go missing
- ✗ Water drainage/management issues
- ✗ Requires frequent filter maintenance
- ☢ 2-hose models are more efficient than single hosed models
Mechanical Cooling: Mini Split Heat Pumps

- Provides cost savings: offers both heating and cooling
- Very efficient
- Quiet operation
- Low energy costs
- Requires only a small hole in wall
- May be used for multiple rooms
- Expensive to purchase and install
Resources for adding mechanical cooling

- Cooling System Assessment Guide
- Cooling System Specifications
- Air Conditioner Sizing Worksheet
- Air Purifier Sizing Worksheet
A Word on Energy Management and Cooling

- Mechanical cooling increases energy use
- Utility incentives are for energy savings
- No rebate programs to add cooling in multi-unit residential
- Contact energy@bcnpha.ca for help and more information
Contact BC Non-Profit Housing Association for help

- Free Virtual Energy Audits
- Capital Planning Services
- Energy Management Services
- Support with Retrofit Funding
Questions?
Thank you for attending

Contact:
energy@bcnpha.ca